

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of  
Wireless E911 Location Accuracy  
Requirements

PS Docket No. 07-114

**COMMENTS OF AT&T**

On September 9, 2013, the Public Safety and Homeland Security Bureau (Bureau) released a Public Notice announcing a workshop to be held on October 2, 2013, and seeking comment on several topics related to improving the quality of wireless E911 location accuracy.<sup>1</sup> Ostensibly, the catalyst for this Public Notice is the August 12, 2013, letter sent to the Commission by the California chapter of the National Emergency Number Association (CalNENA) in which CalNENA raised certain concerns about AT&T Mobility's, Sprint-Nextel's, T-Mobile's, and Verizon's (collectively "Top Four Carriers") performance in providing Phase II location information. Yet, the CalNENA letter never actually made any allegations with respect to the *accuracy* of the wireless Phase II location information being provided, only its perception of the percentage of calls providing location information (*i.e.*, CalNENA raised concerns about *yield* and not *location accuracy*).<sup>2</sup>

To date, AT&T Mobility, Verizon Wireless, and T-Mobile USA, Inc. have filed letters with the Commission in response to the CalNENA letter.<sup>3</sup> These letters went to great lengths to

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<sup>1</sup> Public Notice: Public Safety and Homeland Security Bureau Announces Workshop on E911 Phase II location Accuracy, DA 13-1873 (Bur. Sept. 9, 2013) (Public Notice).

<sup>2</sup> Letter to the Honorable Mignon Clyburn, Chairwoman, Federal Communications Commission, from Danita L. Crombach, ENP, CALNENA, (Aug. 12, 2013) (CalNENA Letter). In the Public Notice, the Bureau refers to this letter as an "ex parte" presentation; however, the matters discussed in the CalNENA letter never arise to the level of a "presentation" as defined in Commission Rule 1.1202(a).

<sup>3</sup> Letter to the Honorable Mignon Clyburn, Chairwoman of the Federal Communications Commission, from Joseph P. Marx, AVP – External Affairs/Regulatory, AT&T Services, Inc., dated Sept. 6, 2013 (AT&T Response Letter); Letter to Marlene H. Dortch, Secretary, Federal Communications Commission, from John T. Nakahata, Counsel to T-Mobile USA, Inc., dated Sept. 5, 2013 (T-Mobile Response Letter); Letter to Marlene H. Dortch, Secretary, Federal

dispel any misconception that the Top Four Carriers implicated in the CalNENA letter were failing to meet their regulatory obligations to provide wireless Phase II location information or that there was any crisis with respect to public safety in the State of California or elsewhere. Moreover, in their letters, these carriers provided their perspective on why it would be that the CalNENA data on yield might differ from those of the carriers. In a nutshell, the CalNENA data appear to reflect some indication of the number of times the PSAPs in question *pulled* Phase II location information from the PSAPs' automatic location information (ALI) database and not the number of times the wireless carriers in question *delivered* the information to the Global Mobile Location Center (GMLC) or the Mobile Positioning Center (MPC), which would make it available for retrieval.<sup>4</sup>

Because of the efforts of the Top Four Carriers, the Bureau has been fully apprised of these facts and of the efforts of the Top Four Carriers to improve Phase II location information and of the need for the public safety community to adjust internal processes to help support those efforts. With these comments, filed in response to the Public Notice, AT&T Services, Inc., on its behalf and on the behalf of its affiliates, (AT&T) continues its dialogue with the aim of assisting the Bureau's analysis of the challenges surrounding location accuracy, generally, and indoor location accuracy, specifically.

### **DISCUSSION**

Much has been made about the significant expansion of wireless usage over the past few years, and the number of wireline subscribers that have "cut the cord" to become wireless-only households. Supposedly this phenomenon means that there has been an increase in the number of wireless calls being placed from indoors, including an increase in 911 calls. To this point, it should be noted that AT&T Mobility—and presumably other wireless carriers—does not and can

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Communications Commission, from Nneka Ezenwa Chiazor, Executive Director – Federal Regulatory, Verizon, dated Sept. 11, 2013 (Verizon Response Letter).

<sup>4</sup> For clarity, AT&T hereby incorporates by reference the AT&T Response Letter into these Comments.

not maintain call data on the origin of the call; that is, whether calls originate indoors or outdoors. It may be possible for carriers to speculate in this regard, but such speculation wouldn't be an appropriate basis for establishing standards or formulating rules. What's more, while there is some basis for speculating that AGPS-based indoor location accuracy may generally suffer in comparison to outdoor calculations (*e.g.*, unimpeded access to satellites), it is not at all statistically certain that even the majority of indoor AGPS-based locates are less accurate than outdoor locates. Not all indoor locations are equal, and not all indoor calls are equal. For example, a call from a single family dwelling may be just as accurate as an outdoor call. Or a call from an office building made close to a window may be as accurate as well. There are simply too many variables at play to make constructive statements of broad applicability. That said, however, there have been no comprehensive studies that confirm the supposition that there has been an increase in the number of wireless calls being placed from indoors. And, to AT&T's knowledge, there hasn't been any study showing a decrease in wireless Phase II location information provided to PSAPs. Consequently, there are no studies showing a correlation between any alleged increase in wireless indoor calling and any purported decrease in accurate Phase II location information.

Presumably to support the supposition that an *increase* in indoor wireless calls equates to a corresponding *decrease* in automatic location information (ALI) accuracy, the Bureau has requested specific data that quantifies the increase in wireless calls to 911, particularly to show the increase in wireless 911 calls from indoor environments. While we have no way to specifically quantify any increase in wireless 911 calls from indoor environments, available data implies that this supposition may be incorrect. Based on drive testing, handsets using AGPS provide quite accurate ALI—meeting or exceeding the Commission's location accuracy requirements. But because AGPS does not generally work as well indoors as it does outside where handsets have an unimpeded view of multiple satellites, the expectation is that an increase in indoor wireless calling would produce a corresponding drop in the number of location estimates made from AGPS. After examining AT&T Mobility's accuracy data for the five cities

referenced in the CalNENA letter for the 12-month period prior to the data of that letter, however, we have actually seen a seven point *increase* in the percentage of AGPS locates—from roughly 71% to over 78%. As this data represents all calls for which a handset-based location estimate was attempted,<sup>5</sup> it would appear to support the conclusion that any overall increase in indoor calling hasn’t translated into an increase in calls *failing to produce an AGPS locate*.

The Bureau cites to the CalNENA Letter and asks whether “the data in the record support CalNENA’s contention that there has been a decline in the delivery of accurate Phase II location information in the past few years.”<sup>6</sup> In brief, no, the data do not support that contention. In fact, the CalNENA Letter doesn’t even support that contention. As explained in the AT&T Response Letter, as well as those of T-Mobile and Verizon, the problem with the data provided by CalNENA is that it is incomplete. At most, it might give some indication of how often the affected PSAPs need to rebid to get location information from their ALI databases. Otherwise, the data provide no evidence of the number of times carriers calculate location information or the number of times that location information is delivered to the GLMC/MPC.<sup>7</sup> And it certainly does not address in any manner the level of accuracy of the location information being delivered by the subject carriers.

It is also true that AT&T’s Response Letter doesn’t address the level of accuracy either. This is so because it addresses the issue raised by the CalNENA Letter; *i.e.*, location information yield. The AT&T Response Letter refutes CalNENA’s assertion that AT&T Mobility’s location

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<sup>5</sup> This data includes both indoor and outdoor location attempts for all calls lasting over 30 seconds for which a handset based AGPS location attempt was made. It does not include data from our network based Uplink Time Difference of Arrival (UTDOA) solution.

<sup>6</sup> Public Notice at 2.

<sup>7</sup> Largely lost in this discussion of location information is the question of how often callers seeking emergency help, or others on behalf of someone in need of emergency help, are able to relate to the PSAP the caller’s location, making it unnecessary to obtain location information from the ALI database. Along these lines, any purported increase in 911 calls originating indoors would not necessarily translate into an increase in the number of 911 calls in which the caller is unable to communicate the caller’s location. And, in point of fact, it is highly likely that any increase in the number of 911 calls made from indoor locations has resulted in more accurate location information for emergency call takers because it stands to reason that people are more likely to know where they are indoors than when moving around outdoors.

information yield in the subject California counties has declined. But it is also true that, with the increasing use of AGPS technology, and in conformance with the Commission's location accuracy rules, AT&T Mobility has seen improvement in the accuracy of its Phase II location information.

The Bureau also seeks information on the measures wireless providers undertake in terms of ongoing monitoring of Phase II performance on both an individual call basis and an aggregated basis. AT&T monitors two critical metrics to support its CMRS 911 compliance obligations. *First*, in order to measure accuracy in an on-going fashion, AT&T performs drive testing on a county basis to confirm compliance with the county-level accuracy benchmarks. *Second*, AT&T monitors the location success rate (LSR) for all live 911 calls to ensure that it provides Phase II location estimates for all calls.<sup>8</sup> AT&T's LSR data show that AT&T Mobility provides a location estimate for over 98% of all 911 calls made on its network.<sup>9</sup>

The Bureau has asked whether Phase II yield has been affected by wireless carriers' migration to new network technologies (from 2G to 3G/4G networks) and to new location technologies. Based on AT&T Mobility's LSR data, it would appear as if Phase II yield has improved and remains very high. Additionally, the migration to newer technologies has meant: (1) increased accuracy in the Phase II location information provided, especially in rural areas where the number and location of cell sites made trilateration-based location data less reliable; (2) a decrease in reliance on a single vendor providing proprietary technology; and (3) lower costs. AT&T's initial deployment of the network-based technology provided a quick method to cover 100% of subscribers, but it took considerable effort to build and maintain this network to provide accurate location estimates. Consequently, moving away from that initial technology has also proved to be a much more effective and efficient method of providing location estimates. And, as AT&T's LSR data reflect, that movement has also resulted in a considerable

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<sup>8</sup> See AT&T Response Letter at 2.

<sup>9</sup> These calls must be of sufficient length to allow the location technology to calculate a location estimate (normally a minimum of 30 seconds).

improvement in the percentage of calls delivering AGPS ALI. This is also due in part to incremental improvements seen in the handset and chipset technology.

The Bureau inquires whether currently available location technology is able to deliver more precise location information than the Commission's current E911 rules require and whether there are other advancements that can provide vertical location (z-axis), as well as horizontal location. While the industry has made great strides in implementing improved location accuracy, we are only now approaching the third-year benchmark of an eight-year improvement plan. We have seen improvements in many areas of the country where previous technologies were challenged to provide location estimates but there are still challenges ahead. Indoor location accuracy and vertical location are both areas where considerable work remains. Nevertheless, we caution against trying to impose aggressive rules ahead of either consensus on standards for indoor location accuracy or proven technologies. AT&T, along with others in the industry, has been actively participating in the Communications Security, Reliability, and Interoperability Council (CSRIC) to explore how to improve and evaluate the accuracy of indoor location information. As reported in its first report last year, the CSRIC setup a location accuracy test bed and asked vendors to test their location solutions under real world indoor conditions. Three vendors participated in this test bed and, while these technologies offered a promising view of what may be possible in the future, the recommendation from CSRIC was to continue evaluating any potential performance improvements or new technologies in the future.

With respect to the availability of vertical location accuracy data, considerable work remains. While AGPS does provide the capability to provide an estimate of above-sea-level altitude, there is still a lot of variability in this data and, without the appropriate context about the environment, that data will be all but useless to public safety. For example, it may be possible to determine that a caller is plus-or-minus 100 meters above sea level, but, without being able to relate this information to a specific floor of a building, it will be of limited use when deploying public safety resources. The CSRIC working group exploring indoor location accuracy is scheduled to resume in CSRIC IV and should be allowed to continue to examine the technology,

as well as the vendors, to ensure whatever path the industry takes in the future to provide better indoor location information, including vertical location information, is a wise investment of money, time, and resources.

**AT&T**

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